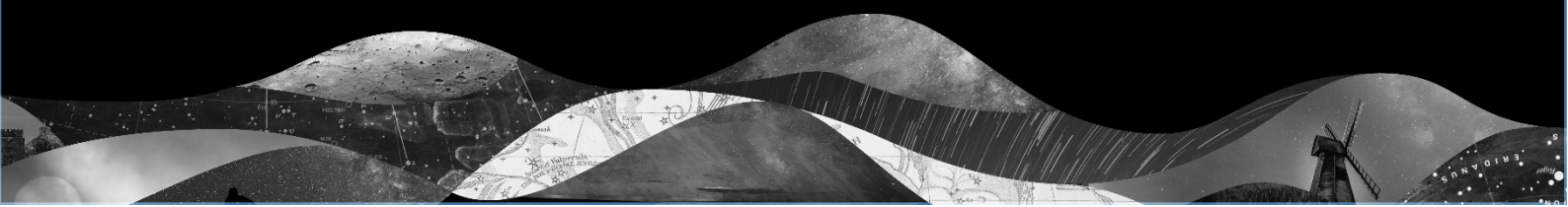


SOUTH DOWNS NATIONAL PARK

DESIGN GUIDANCE FOR EVENTS, CREATIVE COMMISSIONS
AND LIGHTING FESTIVALS IN DARK SKIES





Neil Jones/SDNPA

CONTENTS

INTRODUCTION

PAGE 3

WHO IS THIS GUIDANCE FOR

PAGE 3

WHAT ARE DARK SKIES AND WHY ARE THEY IMPORTANT?

PAGE 4

WHAT IS LIGHT POLLUTION?

PAGE 5

OVERRIDING PRINCIPLES

PAGE 6

CREATING A SENSE OF PLACE

PAGE 7

DARK SKIES MAP

PAGE 8

ASSESSING THE IMPACT

PAGE 9

LIGHTING IMPACT TABLE

PAGES 10

LIGHTING TYPES DESIGN GUIDANCE

PAGE 11 – OPEN SKY LIGHTS

PAGE 14 – BUILDING PROJECTIONS AND ILLUMINATIONS

PAGE 17 – DECORATIVE AND MOOD

PAGE 20 – ARTISTIC CREATIONS

PAGE 22 – TEMPORARY LIGHTS

CASE STUDY

PAGE 26

FURTHER INFO

PAGE 27

INTRODUCTION



Light festivals and illumination events are becoming a regular sight all across the South Downs and UK, especially during the festive winter season. They offer residents and visitors a unique experience and can transform an existing location with a magical sense of place and theatricality. Because of their limited operational time, events of this type are not usually subject to planning control and are considered a 'temporary' development¹. As such, their impact on the local environment is rarely considered.

The type of lighting used at these events are highly prominent and can be visible for many miles around the site, thereby reducing dark sky quality. Bright, powerful lights can be installed with little regard for dark skies or any basic lighting impact assessment. As a result of the growing popularity of these events for commercial, promotional or creative purposes, the SDNPA is seeking some best practice principles within this guidance for artists, creative commissioners and event organisers to follow. The aim is to limit the temporary loss of dark skies caused by the prevalence of inconsiderate and highly polluting lighting by making the right decisions for nature and to protect the South Downs International Dark Skies Reserve.

The SDNPA will give advice and consultation on any aspect of lighting design for events, festivals and creative commissions. If you need advice and guidance please contact the South Downs National Park Authority

01730 814810: info@southdowns.gov.uk

WHO IS THIS GUIDANCE FOR?

This guidance is for anyone who is using lighting for:

- Light festivals
- Artistic installations
- Creative commissions
- Non-domestic festive illuminations
- Music festivals and outdoor performances
- Operating temporary generator lighting towers

This guidance **does not aim to ban Christmas lighting** and **will not** cover;

- Domestic Christmas lights or Local Authority Christmas lights mounted on streetlights

¹ If under 28 days



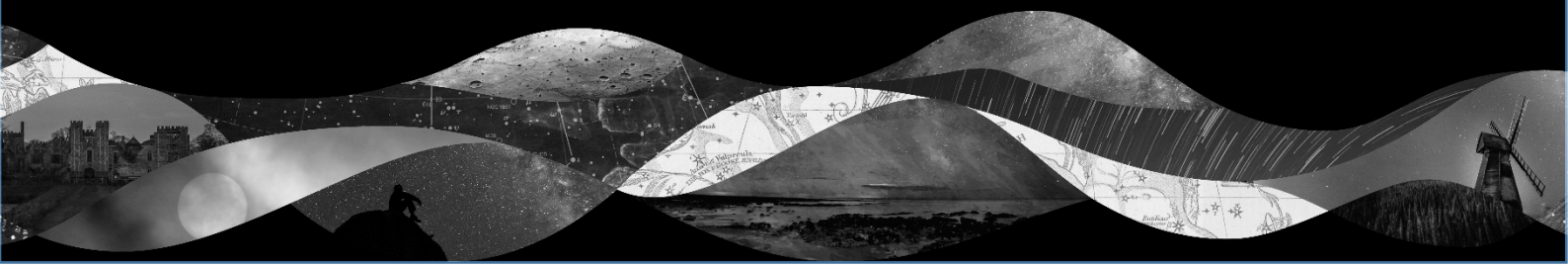
WHAT IS A DARK SKY AND WHY ARE THEY IMPORTANT?

Dark Skies are important. They are places in which light pollution is sufficiently low to enable wildlife, residents and visitors to live under a starry sky, and be acquainted with the Milky Way – our galactic home. This offers an essential connection with the wider cosmos and is highly regarded as a special quality by residents.

As with other nations, we are slowly losing our ability to see the night sky as development and inappropriate lighting encroaches into dark space. The South Downs National Park successfully achieved International Dark-Sky Reserve status in May 2016, encouraging the Authority, partners and residents to become committed to reducing light pollution where it is unnecessary and where it reduces sky quality. The SDNPA primarily achieves this through its local plan and a specific technical advice note on dark skies upon which this guidance is based. However, it is crucial to emphasise that protecting dark skies does not mean banning all lights. What is critical is;

The right light, in the right place, at the right time, with the right intensity.

It is vitally important that illuminated events, creative commissions or outdoor exhibitions take the night sky into consideration, especially since the quantity of light deployed by the installations used often trickle down to smaller businesses and homeowners who may regard this as acceptable practice. Without careful consideration, it is likely that these lighting installations will intensify the loss of darkness and consequently impact on human health, wildlife, carbon emissions and our connection with the night sky.



WHAT IS LIGHT POLLUTION?



Sky glow

This is the brightening of the night sky which can be seen emanating from the horizon, originating mostly in built-up areas. It is caused by badly directed light sent above the horizontal and scattered by aerosols and particles in the air. It can also be reflecting from surfaces. Light that travels near the horizontal is the most damaging as it travels furthest through the lower, denser atmosphere. This can be avoided by ensuring that lights are directed downwards where the light is needed.

Glare

This is the uncomfortable brightness of a light source when viewed against a contrasting darker background. In less densely populated rural areas, glare will seem relatively more intense than in urban areas. This is particularly noticeable when looking from raised viewpoints into the darker landscape below.



Light Intrusion

Sometimes called 'light trespass', this involves light spilling beyond the property or area being lit. Although this pollution generally relates to windows and intrusion into private property, the term 'light intrusion' also applies to natural habitats and areas of high species interest.

Presence – a fourth consideration

Even if a lighting scheme were designed that avoided sky glow, intrusion and glare, there still exists the possibility of significant impact on dark and sensitive landscapes and wildlife due to the mere presence of the lights. This applies to impacts from both exterior and interior lighting. When the presence of lighting itself creates negative impacts, alternatives and re-siting should be considered.



OVERRIDING PRINCIPLES

You should think about embedding these essential principles in all phases of your event and commission planning.

★ CREATE A CONSIDERATE EXPERIENCE

Ensure that your event's overall experience has a regard for the specific setting and the special dark qualities of its surroundings. Creating a sense of place with your illuminations does not need to unnecessarily degrade these qualities.

★ PROTECT THE OPEN SKY

The sky is not a billboard. Avoid intentional and inconsiderate illumination of the sky for your own purposes.

★ LIMIT IMPACT

Adopt established best practice lighting principles and use installations that constrain the impact within the site by;

- Avoiding cool white light
- Reducing Upward light
- Turning off light at close of event
- Using wider beam angles on more powerful spots
- Lowering the power

“Dark Sky areas are challenging the harmful effects of over-illumination and allowing people to become reacquainted with dark space and the night sky. Because they provide an especially dark backcloth, they afford rich possibilities for the inventive, creative use of illumination, and are effective settings for light festivals.

Festive lighting can offer rich visitor experiences, providing delightfully unfamiliar visual sensations and memorable experiences. In addition, they can enhance a sense of place, reinforcing the significance of iconic elements in the landscape, bringing attention to both overlooked features and drawing on historical narratives, while simultaneously making familiar places suddenly seem strange. Yet the sense of place offered by Dark Sky areas is also underpinned by the powerful sensations of darkness and the star-filled sky that residents and visitors experience.

Excessive sky glow, light trespass and glare can, if festive light installations are not carefully designed to align with dark sky aesthetics and values, harm wildlife and obscure the night sky.”

Tim Edensor, Professor of Social and Cultural Geography, Manchester Metropolitan University, author of *From Light to Dark: Daylight, Illumination and Gloom* (2020) and co-editor of *Rethinking Darkness: Cultures, Histories, Practices* (2021)

CREATING A SENSE-OF-PLACE



A lighting event can create a sense of place for visitors. The lights used, the installation and the ‘narrative’ told with the piece may provide visitors with an interactive experience, creating a unique relationship with the space - it is what makes the events ‘magical’. A compelling narrative theme can be embedded to enhance visitors’ connection with the installation or projection. In this respect it is important to design and incorporate lights that augment a sense of place, rather than selecting a random selection of lights that add little other than unnecessary pollution beyond the site.



It is equally important to be considerate to the existing sense of place and its connections with its surrounding landscape – indeed, prevalent dark skies within an area can effectively contribute to the formation of a distinctive sense of place. Even though the event could be within or near an urban setting, it is crucial to consider the wider impacts of installations to the wider setting. It is imperative to avoid degrading an existing sense of place.

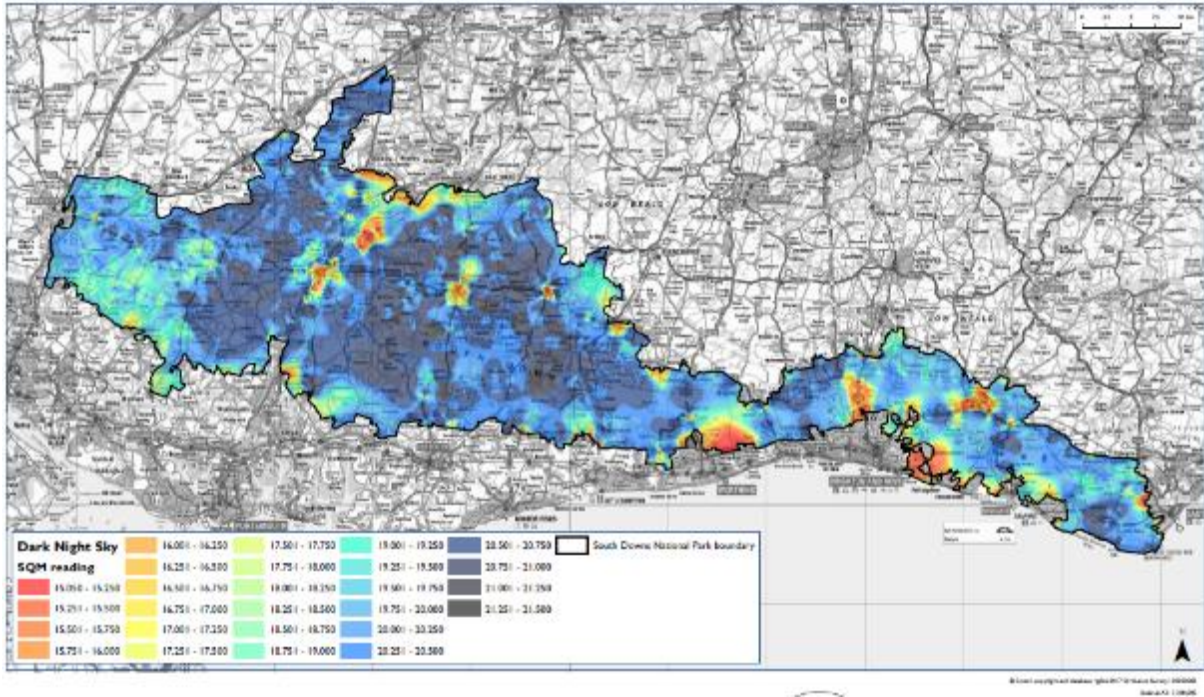
In respect of dark skies, this means to have consideration for a place’s existing sky quality and respect for how it is protected. This emphatically does not mean that lighting events should be banned but that they should be designed in a considerate way that has regard for the sense of place dark skies offers to the community.

DARK SKIES MAP

Dark skies are measured using satellite and ground based measurements. The figure below shows SDNPA ground measurements that indicate overhead sky quality – the ability to see stars.

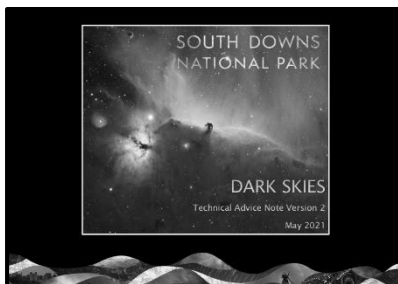
Anywhere with a reading of 20.5² (light blue to black) and above, will enable you to see the Milky Way. While there is a core area, there are many places across the Downs where you can access dark skies – this map will help to indicate more darker and sensitive areas that benefit from controls on light pollution.

An online map can be found on the [South Downs website](#).



Rule of thumb: Dark sky conditions (20.5+) will emerge within 1km of the end of street lighting. Nearly all rural areas in the South Downs will have dark skies of sufficient quality to see the Milky Way.³

The South Downs has created a map showing ambient light level zones (E-zones 0-4) based on this sky quality data. The ambient zones which are consistent with lighting industry standards, dictate how planning policies are applied and show – in broader terms - where dark skies are.



If you are required to submit a planning application for your work you will need to determine the E-zone. Refer to the [South Downs Technical Advice Note on Dark Skies](#) for more information.

² Sky quality is measured in magnitudes (brightness) per arcsecond² (area of sky).

³ This map was developed in 2016. There is an ongoing programme of continual measurements that will feed into an updated map. Recent measurements show that the western end (the light blue area) is darker due to lighting improvements and measures above 20.5 magnitudes per second sq.

ASSESSING THE IMPACT

To get a rough assessment of the impact of your illumination on the night sky you can use two easy methods:

1. Looking at the cloud base

Bright lights and prominent sources of light pollution will illuminate the bottom of the cloud base. Under a typical UK cloudy sky the cloud base will sit within 0-2km above ground level. If you can see a prominent⁴ increase in the amount of cloud brightness when compared to normal cloud brightness, this means your lights will be having a significant impact on the dark skies and will be visible for many miles. You should look to minimise this effect as much as possible.



2. Overlooking to see prominent light domes

If you stand away from the site, you will probably see visible light domes from installations. The domes indicate areas where the lighting is reflecting from surfaces on the ground or that there is a significant amount of direct upward light. You should ensure that all bright lights within these domes point downward, reduce the lamp output or spread the lights out over a bigger area. You will not be able to remove a light dome completely, but you can reduce the size by pointing lights down and reducing intensity.

White coloured domes will be more prominent because white light penetrates the air further than other coloured light. White light will also illuminate the cloud base more. Consider the use of alternative colours.

⁴ A prominent effect will be one that easily distinguishable from other sky light domes – urban or rural

LIGHTING IMPACT TABLE

Different illuminations will have a different level of impact risk to dark skies. The following table summarises general illumination classes with specific risk impacts for typical lights used. Most lights used can be adjusted or appropriately installed to lower the impacts on dark skies. You should identify which class your lights will fall under and look to reduce the impact where appropriate.

Specific design guidance for typical lights can be found in the following sections. The rating is based on the impact assessment relative to domestic (~low, med), commercial lighting (~med to high) and industrial (~high to very high) in the rural landscape.

LIGHTING CATEGORIES	LIGHTING TYPES	POTENTIAL RISK OF IMPACT
Open Sky Lighting	• Sky Scanner Spot Lights	Very High
	• Lasers	High
Building Projection and Illuminations	• External lighting of building facade	Med
	• Internal illumination through glazing	Low
	• Dynamic Projections	Med
	• Dynamic Lasers and spots	Med
Decorative and Mood	• Background Space and Area	Med
	• Tree up-lighting	Med
	• Theatrical Spots	High
	• Festoon Lighting	Low/Med
Artistic Creations	• Low powered sculptures and objects	Low
	• Larger Focal Pieces	High
Temporary Lights	• Lighting towers	Very High
	• Security Lights	High

RELATIVE LANDSCAPE IMPACT

The impact of any light will depend upon where it is in the landscape and what surrounds it. When installations are surrounded by close natural shielding the impact may be constrained to the local environment. Lights within open and exposed locations will have a much greater relative impact because they can be seen from greater distances. In this respect, even low powered lights and small installations can have a greater impact when located in more visible areas. This wider relative impact should be taken into account.

PREFERENCE FOR URBAN LOCATIONS – CONTRAST

Due to the ambient lighting conditions in urban locations, there will always be a preference to locate lighting installation, events and creative commissions in these locations. Although this will alter the contrast between the installations and the darker rural landscapes, the level of light should be sufficient to provide a sufficient experience and sense of place. As the case study on page shows, urban festivals can bring in more visitors and still provide a unique experience without degrading the dark skies in the rural areas.

It is inappropriate to use dark skies for a preferred back-drop for lighting.

LIGHTING CATEGORIES

OPEN SKY LIGHTING

Lighting that purposefully illuminates and pollutes the sky over-head has a significant impact on dark skies and should be avoided.

Lighting types will include

- Scanner spot lights
- Lasers

Due to desires for impactful theatrical effect, high powered and highly penetrative lights are often used; typically 'scanner' spot lights and laser systems. This means that these lights will be visible for many miles⁵ and will reduce the quality of dark skies in the surrounding countryside. As this is in direct conflict with the aims and requirements of maintaining the International Dark Skies Reserve, lights that produce prominent open sky intrusions should be avoided.

The sky is not a billboard or blank canvas to be painted over; it is a shared resource, and an intrinsic special quality of the South Downs. Its international accreditation charges communities, residents and authorities to protect it.

You should consider the impact that your lights will have on the sky above residents' houses, including those many miles from the site.

There are examples where planning applications seeking permanent fixtures for open sky lighting have been refused⁶ due to the impacts these lights have on dark skies. Open Sky and Directed lighting may also require approval from the Civil Aviation Authority (CAA)⁷.

⁵ In excess of 10 miles

⁶ Cases in Guildford and Bristol (Exterior Lighting as a Statutory Nuisance Martin Morgan Taylor* and David Hughes (2005), <https://www.britastro.org/dark-skies/pdfs/TaylorHughes.pdf> pp1133

⁷ CAP 736 - Operation of Directed Light, Fireworks, Toy Balloons and Sky Lanterns within UK Airspace (caa.co.uk)



Due to their small beam angle and high output intensity, spotlights that illuminate and scan the sky are **highly intrusive**.

- The use of spotlights on narrow beam, full power and pointing into the open sky should be avoided.

Instead, we recommend the adoption of these design principles;



- Widen the beam angle. This will reduce the penetration into the sky but retain a defined beam close to the ground. You will retain a theatrical effect with a wide beam.
- Lower the power. Modern spots will have various power modes, such as 'eco'. If your spot allows, reduce the power output to reduce the penetration. A Gobo filter could be used as an alternative. You will retain a theatrical effect as the beam will still be defined.
- Use a red colour temperature. Do not use white or blue light as it penetrates through the air more. Use redder colours as that is the colour that will have the lowest impact on atmospheric scattering and nuisance intrusion on people and wildlife.
- Do not point your beams into the open countryside.
- Reduce the number of spot luminaires. Only use the minimum of lights to achieve theatrical effects.
- Do not use spots for unnecessary purposes, such as for pedestrian navigation markers.

Assessment

- Use the cloud base visual method to assess the intrusion. The beam should not be significantly visible on the cloud base.



Laser lights are **highly intrusive**.

- The use of laser light displays on full power that point into the open sky should be avoided

Instead, adopt these design principles:

- Lower the power. If the Laser permits, reduce the laser output power to reduce the light penetration
- Direct away from open countryside.
- Reduce the number of beams.
- Direct towards buildings instead of the open sky (like this example from LewesLight – see page 26).



BUILDING PROJECTIONS AND ILLUMINATIONS

Lights aimed at buildings are commonplace. Generally, the lights are ground based and point upward towards the building which means there can be a lot of stray light if they are installed badly. It is also important to ensure that an appropriate light level is used to avoid over-brightening the building façade. A brightly lit building can be extremely prominent in a dark landscape.

Lighting categories will include;

- External Lighting of building façade
- Internal Illuminations through glazing
- Dynamic Projections
- Dynamic lasers and spots

While there already is some guidance for building luminance provided by the Institution of Lighting Professionals based on ambient lighting zones (E-zones)⁸, there is little advice for dynamic projections with lasers and video. The following serves as a guide in the absence of guidelines:



EXTERNAL LIGHTING OF BUILDING FAÇADE

MED IMPACT



The Institution of Lighting Professionals provides recommendations for building luminance in different environmental lighting areas. In Dark Sky places (E0) and National Park areas, (E1), the recommended building luminance is zero which is difficult to attain for most lighting festivals. For suburban and urban areas, E3/4⁹, lighting designers are often used to verify the illuminances for permanent lighting.

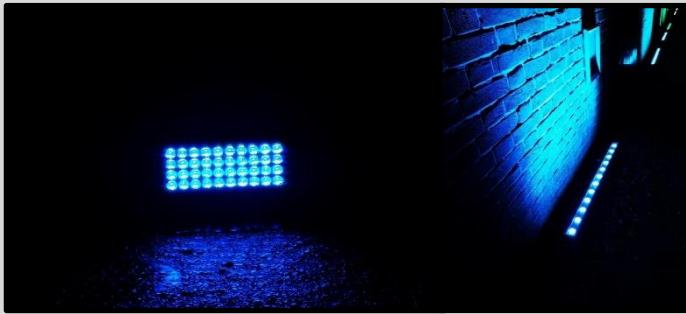
⁸ Ambient lighting zones. E0 – Protected Dark Sky Places. E1 – National Parks. E2 – Rural. E3 – Suburban. E4 – Urban.

⁹ The SDNPA does not use the E2 zone as it is superseded by the E1 National park

As such,

- Avoid illumination of buildings in the rural areas of National Parks. Only use light when it is necessary.
- Create a subtle effect with the illuminance as low as possible
- All lighting should be directed at the building with no stray light escaping into the night sky
- Use barn doors, cowls, louvres to ensure no upward stray light
- Avoid using cool white light, >3000K.

LED Panel Power Rule of thumb approximations:



LED Panel lights are often used to light building facades but their maximum output is much greater than an average street light. To provide more considerate lighting use the following approximate power recommendations to reduce the impact as a starting point.

- For a light at a distance of 5m from the building, reduce the power to 25%.
- For a light at a distance of 3m and less from the building, reduce the power to 10%



INTERNAL ILLUMINATIONS THROUGH GLAZING

LOW IMPACT

Internal illuminations that are projected onto glazing should follow the same principles of external lighting on building facades. LED panel lights that create colourful interior space should adopt the same low power settings.





DYNAMIC PROJECTIONS

MED IMPACT

Buildings illuminated with dynamic projections are difficult to assess due to the changing light levels throughout the display. ILP guidance cannot easily be applied. As such the following general principles should be considered:

- The projections should point directly at the building and not allow any stray light beyond the building façade
- Try to design displays that maintain similar light levels throughout to avoid conspicuous difference in brightness
- Use the lowest light output possible to achieve the desired effect



DYNAMIC LASERS AND SPOTS

MED IMPACT



Should always be aimed at buildings and preferably aimed at non-reflective surfaces.

The power should be reduced to the minimum needed to produce the desired effect.

DECORATIVE AND MOOD

Floodlights, uplighters, spotlights and festoon lighting is often used to create the decorative and background ambient light for a space’s mood. While this is generally more subtle than other forms of event lighting the cumulative effect could create significant sources of light pollution.

Lighting categories will include;

- Background space and area
- Tree Up-lighting
- Theatrical Spots
- Dynamic lasers and spots
- Festoon lighting



BACKGROUND SPACE AND AREA

MED IMPACT



Floods and area lights are typically used to provide a background colour wash in spaces. Panel LEDs, small spotlights and security style lights are often used to set ambient colours in spaces, all with different levels of power, spread and intensity. While an individual light may not have an impact, the cumulative use of many lights in one area may create a significant light dome. As such the cloud base assessment should be used.

- Direct the lights towards objects and away from the open sky
- Use barn door, cowls and louvre shielding to reduce stray light
- Avoid white light
- Reduce the power to the minimum setting to produce the appropriate effect
- For adjustable LED Panel lights aim to use around 10% power and no more than 25%





- Ensure that you have assessed the tree for wildlife disturbance by light. This is particularly important in bird nesting season (1st March to 31st July)
- Aim to have a lumen output of any single lamp to around 500¹⁰ lumens, especially if up lighting small trees. 250 lumens is more appropriate for small trees.
- Trees in darker areas should be illuminated with less lumens as they can stand out more.
- Avoid illumination of tall trees with a high, sparse canopy - e.g. Scot's Pine – as this will need brighter lights to accomplish the same effect
- Ensure that all the light is 'captured' by the canopy at the lowest point possible
- Instead of colour washes with one bright lamp, aim to use more low powered lamps such as lanterns.

¹⁰ 1000 lumens is the IDA limit for up lighting in urban communities. For rural IDA places, a 500 lumen limit is required, but this may be too low to generate a noticeable impact.

★ THEATRICAL SPOTS

HIGH IMPACT



In contrast to the light powered use of sky scanners, spots can be used with a more theatrical purpose, often in combination with other lamp types and to music. Despite the different purpose, the same principles should be used as with the sky scanners:

- Warm temperatures avoiding white
- Wider beam angles
- Reduced power
- Pointing at objects rather than up into the open sky
- Use in areas with a high level of natural surrounding on-site shielding, e.g. trees, hills, buildings
- Constrain white spotlights to illuminate the stages rather than the sky

Use the cloud base rule of thumb to assess the impact.

★ FESTOON LIGHTING

LOW IMPACT

MED IMPACT



Festoon lighting generally means assemblages of many lower powered lights such as strings, lanterns, fairy lights and bulbs that are used to light spaces and paths. Provided they use low powered bulbs, as such they are generally low risk.

To ensure a good spread of light make sure they are pulled apart sufficiently to avoid bunching in one place. It will look nicer.

When brighter bulbs are used in great numbers, then the impact can rise to Medium. Brighter festoon lights can also create glare issues, which can be a safety issue for pedestrian transit areas.

ARTISTIC CREATIONS

Artistic lights are unique installations that grab the attention of the eye, contribute to a sense of place and can form focal points within an area. As such they are very varied and cannot be easily limited with specific guidance.

Lighting categories will include;

- Low powered sculptures and objects
- Larger focal pieces



LOW POWERED SCULPTURES AND OBJECTS

LOW IMPACT

MED IMPACT

These will include small glow sculptures and installations that use low powered lamps. Although they may comprise many small and low powered elements, the impact is relatively low to medium. As such there is no design advice for these types of installations.



While some installations may be low risk, their position in the landscape may increase the impact to medium. This is particularly critical in parts of the landscape that are open, exposed and can be seen from many miles; they will stand out more against a dark background. A landscape impact should be undertaken to ensure that any brighter sources do not pose an enhanced level of impact.

A PLACE
BEYOND
BELIEF



These can be large and are usually brightly lit and are designed to create a visual impact. They often require supporting structures to light from within the inside or to install externally mounted lights. While they are harder to control, they can significantly contribute to the overall footprint of the event. The following recommendations apply

- If possible – manufacture with dimmable lights, e.g. LED string.
- Use a lower internal illuminance setting
- Avoid reflective surfaces if illuminating with external spots
- Use warmer temperatures
- Position in places where natural or built infrastructure shields the light from views of the surrounding countryside



TEMPORARY FLOODLIGHTING



LIGHTING TOWERS

VERY HIGH IMPACT

Lighting towers are often hired or used for events. They are typically used for public safety in car parks or high pedestrian areas near entrances. Due to the huge range of potential uses they are very bright and prominent light sources and can have a very significant impact. They usually have a number of lamps on erectable poles that use very bright white lights. If installed badly and overused they can be noticeable for many miles.

Lighting tower hire companies will often refer to the size of the area to be illuminated and recommend towers based on the intended use. The lights are capable of illuminating areas 100m away and in excess of 6000m². The lighting towers are also intended to be used over a range of activities - including fine industrial work¹¹ - which requires significantly brighter illuminances than those usually required for public events. This also means that you can create significant glare issues for your visitors – this in itself is a safety issue.

Both the lighting area and the power of the light could be significantly greater than your event needs. It is important to check your lighting plans with the retailer before you hire.

A significant amount of pollution can be avoided with the appropriate rental and correct installation

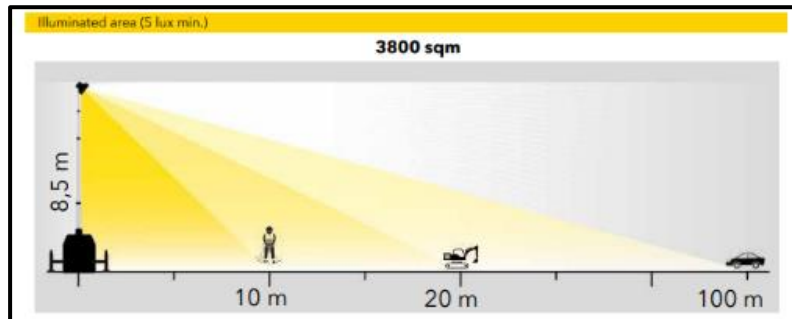


¹¹ Illuminances for fine detail work can be in excess of 100 lux



BEFORE HIRE:

- Understand the needs of the area you wish to light
- Understand what activities people will carry out in these areas and what conflicts¹² may arise
 - For areas where the public will walk you need to specify around 10¹³ lux.
 - For car parking or where people and vehicles mix around 20 lux



- Ask for the lowest power option for your needs.
 - A single 90W LED produces 12000 lumens and is a little as a streetlight at the same height.
 - A single 150W LED produces 15000 lumens which is nearly double the output of a streetlight.
- Ask for the lowest Colour Temperature. Aim for 3000K¹⁴
- Ask for dimmable controls
- Ask for asymmetrical lamps. The luminaire internal reflective shape is designed to throw light horizontally – and less backward - without increasing the upward angle.
- Ask to see the product specification sheet if there is one. The spec may show which product is appropriate for the area you wish to light. For example,

		BATTERY		DIESEL						ELECTRIC			
		HiLight Z3+	HiLight S2+	HiLight H6+	HiLight B6+	HiLight V4+	HiLight V5+	HiLight V4	HiLight V4W	HiLight E3+	HiLight P2+	HiLight V2+	HiLight V3+
Light coverage m ²		3000 (average 10 luxes)	2000 (average 10 luxes)	6000 (average 20 luxes)	6000 (average 20 luxes)	4000 (average 20 luxes)	5000 (average 20 luxes)	4000 (average 20 luxes)	4000 (average 20 luxes)	3000 (average 12 luxes)	2000 (average 10 luxes)	2000 (average 10 luxes)	2500 (average 10 luxes)
Lights		LED	LED	LED	LED	LED	LED	Metal halide	Metal halide	LED	LED	LED	LED
Wattage	W	4 x 160	4 x 90	4 x 350	4 x 350	4 x 250	4 x 350	4 x 1000	4 x 1000	4 x 160 1x500	320	320	4 x 120

¹² A common conflict will be cars and people using the same area to move through

¹³ Lux levels are referenced from BSI standards on work places and HSE guidance.

¹⁴ It is unlikely that this is achievable. Due to the variety of purposes the lights must cover the colour for intense detailed work. This means that 4000K may be the lowest option.



UPON INSTALLATION:

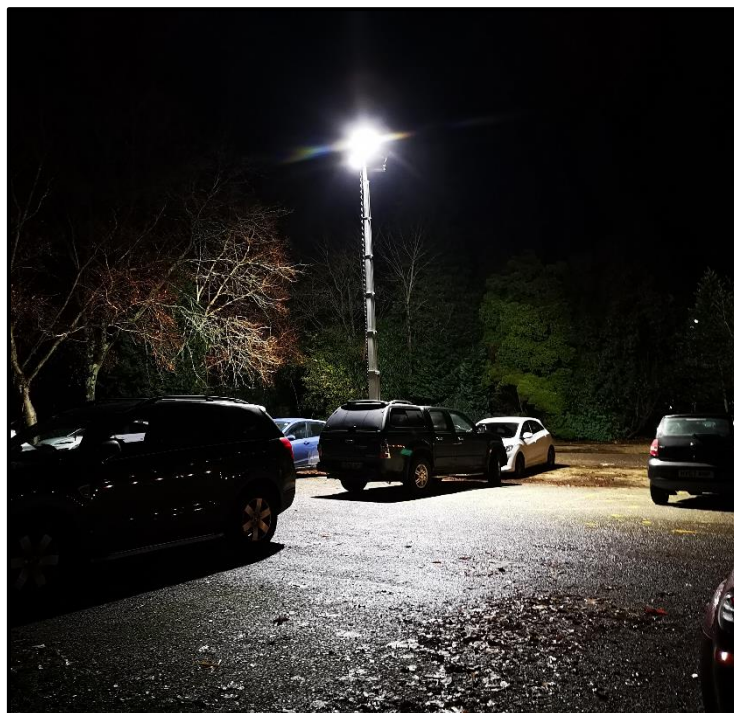
- Set the lamps so the light beam shines below the horizontal – ideally, they should point downwards. Asymmetric lights are designed to achieve this.
- Use the lowest height needed. Residential Street lights are usually 5-7m.
- Position the light in the middle of the area you wish to light so all the lamps are useful.
- Only use the appropriate number of lights – turn off individual lamps if you are over-lighting or if they are not illuminating the area



CHECKING THE SURFACE ILLUMINATION

For permanent installations a lighting designer will calculate the correct illuminances to ensure public safety. As this is more difficult with temporary lighting you can roughly measure the illuminance yourself to check your light levels.

- Use a smart phone. Lux measuring apps are downloadable for phones which measure the illuminance. To assess your lighting measure the illuminance under the light from a variety of distances and decide if the average is roughly your intended lux. Note that the lux will measure high under the light (e.g. 50 lux) and less further away (e.g. 5 lux). If you can, calibrate the app before-hand. Search under 'Lux Meter'.
- You need to be confident that the average is about right and you are providing enough light for the public to safely get around. For example, can they see any trip hazards over uneven ground? Will other users spot them clearly? Will they be able to see and get into their cars easily?
- With a dimmable LED option you can adjust light levels to achieve safety without over lighting the area.



SAFETY IMPACT – GLARE



It is important to note that without any adjustment you could be creating a recognised safety hazard for your visitors. If there is too much badly directed light you could create significant glare issues and make adjacent areas darker. Too much glare is painful and can cause contrast and safety difficulties. This is particularly important for oncoming vehicles in pedestrian walking areas at car parks, drop off points and entrances. By using the right amount of light to achieve the right illuminance you will lower the glare and keep your visitors safe. **Do not underestimate this issue.**

BEING COST EFFECTIVE

Lighting towers use fuel that you pay for. To keep your costs down, you should run as few lights as you need. You can achieve this by positioning the tower in the right place, providing the right amount of light and not letting it escape into the air.

Being cost effective is good for dark skies.

SECURITY LIGHTING

HIGH IMPACT



Security tend to deploy single, bright lights that are installed to provide some level of security or non-public access. The areas to be lit are generally smaller than public areas and as such do not need over bright lamps. They are very similar in power output to the individual lamps found on lighting towers and should be treated with the same care when installing.

It is important that they have a specific purpose and are not installed with an assumption that they will act as a deterrent. It is often the case that security lighting provides light for trespassers if installed badly. They can aid facial detection with CCTV¹⁵ but this is only effective with a well-designed system.

The following advice should be followed

- Ensure you have some method or process to act on a triggered security light. Unless you do, the light is useless and may aid trespassers. If so, avoid the installation.
- Illuminances need only be 10 lux, so a single 10W LED (1,000 lumens) light will suffice without causing a substantial impact
- Lights should be angled down with zero light pointing upwards
- Colour temperatures of 3000K should be used¹⁶
- Separate proximity sensors and timers should be used.
- Halogen lights should be avoided

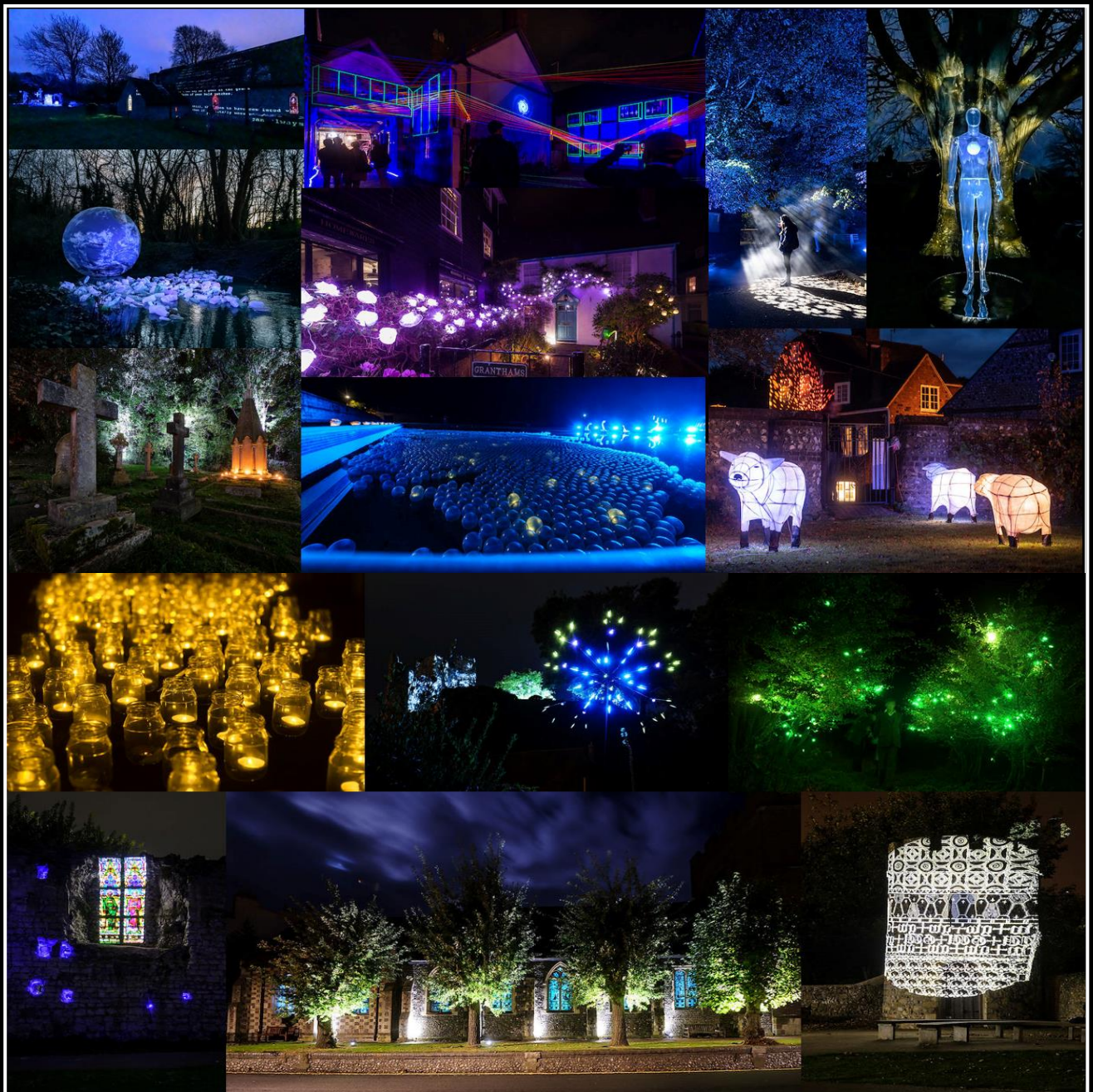
¹⁵ An infra-red system is preferable to visible light systems. No illumination is required.

¹⁶ Individual security lights are available at 3000K

CASE STUDY – LEWES LIGHT

The LewesLight is a festival of light that celebrates the culture, history and the environment in and around Lewes and the South Downs through the medium of light, art design. First held in 2015, the festival has returned every year and each time taking on different narrative themes, such as local history, the climate and water, which come together to enable creativity and a sense of place. It is a community orientated event aimed at all ages and created by a multi-disciplined team of designers, artists, engineers, musicians, historians, poets, educators: all with a love of Lewes and a vision to produce an event that connect with the many diverse and creative people, organisations and business that give Lewes its unique identity and character.

With education at its heart, LewesLight is **design led** with site specific installations feeding from the context of town and country. Importantly, the festival promotes responsible use of light and celebrates the darkness with the countryside and involved the SDNPA throughout the initial process. As a result, the lighting installations provide an appropriate, unique sense of place within the urban environment; and one that does not impact the sky quality of the surrounding environment.



FURTHER INFORMATION

GENERAL EVENTS GUIDANCE

As stated in the South Downs Event guidance, provided the event does not last more than 28 days – including set-up and take-down – planning permission for these type of events should not be needed.

https://www.southdowns.gov.uk/wp-content/uploads/2018/06/SDNPA-Events-Guidance-Note_v2.pdf

SOUTH DOWNS TECHNICAL ADVICE NOTE

While this document aims to provide specific advice for lighting at events, the SDNPA also has a Technical Advice Note on Dark Skies. This TAN is more applicable to permanent installations, but the general principle of reducing the impact is consistent between documents.

<https://www.southdowns.gov.uk/wp-content/uploads/2021/06/DNS-TAN-2021-Main-Document-External-Lighting.pdf>

IMAGES

All images are credited to South Downs National Park unless stated.

GLOSSARY

CCT (K): Correlated Colour Temperature. Defines the colour, not brightness of a light source and is measured in kelvin (K)

LED: Light-Emitting Diode

Lumen: a measure of the total amount of light visible to the human eye from a lamp or light source

Lux: The measure of Illuminance of an area, or how bright a lit surface is

PIR: Proximity Infra-Red. Typically used to detect motion with a sensor

SDNPA: South Downs National Park Authority

TAN: Technical Advice Note

ULR: Upward Light Ratio. The fraction of light emitted above the horizontal

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